Title: **Hydrolab Minisonde Setup and Calibration**

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1.0 OBJECTIVE

To setup and calibrate Minisondes.

2.0 HEALTH AND SAFETY

Personnel should take proper precautions when handling the 12-volt battery, dissolved oxygen probe solution and pH calibration solutions.

3.0 PERSONNEL/TRAINING/RESPONSIBILITIES

Any employee who routinely works in the laboratory should be capable of performing this task. Training of new staff should be carried out under supervision of an experienced technical employee familiar with this SOP before the employee can work unsupervised.

4.0 REQUIRED AND RECOMMENDED MATERIALS

This section lists the required supplies and equipment:

Minisonde	12-volt battery
Minisonde calibration supplies	computer

5.0 PROCEDURE

5.1 MINISONDE CALIBRATION

Minisonde can be calibrated using internal battery or external battery (12 volt). Use the 12-volt external battery to conserve the internal batteries. When plugged into an external power source, the internal batteries are not used.
ALL PAGES REFER TO THE MINISONDE MANUAL.

5.1.1 Computer Setup: [turn on laptop by pressing down top right key with triangle on it. Use this same step to turn off laptop]

1. Double Click on Z-TERM icon on desktop to open program.

2. Connect minisonde to the black cable and lay on table for right now.

3. Minisonde output screen should appear after at least 10 or 15 seconds. If not, check all connecting cables, 12-volt battery charge and the following:
   a.) On Z-term menu click on SETTINGS then CONNECTION to make sure the following parameters are set:
   19200 baud
   8 bits
   No parity
   1 stopbit
   b.) On Z-term menu click on SETTINGS then TERMINAL to make sure the following setting is checked:
   PC ANSI-BBS

4. Once the sonde is responding on screen TURN OFF AUTOLOG - p. 4-22.

5. Transferring the File (This is Hydrolab's term for downloading a file).
   a. follow steps beginning p.4-11
   b. Select YES to power down probes.
   c. Select the previous week's file to transfer. Do not transfer the AUTOLOG file.
   d. Select "Spreadsheet-Importable"
   e. Select "XMODEM" protocol .
   f. Screen will read "STARTING XMODEM transfer..." NOW go to files on the ZTERM menu bar and scroll down to "Receive File as" and select XMODEM. A box will appear on screen showing the progress of the download (takes about 3 minutes). Name the file when prompted and follow further instructions on screen.

g. Now open EXCEL (leave ZTERM open and the sonde lugged in) . Open the file just transferred. Select commas in addition to tabs on the file import prompt screen. (that is the only thing that needs changing on any of those screens.) Now the file should be open in EXCEL and check to make sure that the parameters look like they read correctly for the duration of the run and the batteries didn't give out in the middle of the run, etc. Now go to "SAVE AS" to save file as an EXCEL WORKBOOK file and place "XL" after the name in the box to distinguish it from the raw file. Save it.

6. Go back to ZTERM to Delete the autolog file and the file you just transferred (downloaded). Follow instructions on p. 4-20.

5.1.2 Calibration:

1. Dissolved Oxygen

a.) Follow steps 1 - 7 on pages 3.14 - 3.15 of minisonde manual.

b.) Use 760 mmHg for barometric pressure.

c.) Remember that minisondes use the STANDARD membrane.

2. Salinity

a.) PP. 3-24 - 3-26

c.) For Salinity, the 2 part calibration is not needed. Calibrate only to one standard as is done for the Datasonde hydrolabs. This standard will be what the refractometer reads out of the salt water storage tank.
Note that the conductivity/salinity sensor is NOT a removable cell block as stated in the manual, but is located face to face in a slot on the oxygen sensor.

3. pH

a.) Follow calibration on pp 3.33 - 3.35

Use pH 7 first then pH 10.
No need to rinse probes first with pH solution as this is wasteful. Just rinse well with DI before and after each standard.

b.) **BE SURE THAT SOLUTION USED FOR SONDES FROM TREATED WATER COMES FROM BOTTLES MARKED "ENDOSULFAN HYDROS ONLY".**

4. Temperature (can do this if you want to)

a.) Check temperature against a thermometer placed in the cup with the minisonde sensors.

5. Depth or Level
   a.) Follow calibration on pp 3.41 - 3.42

ENABLE AUTOLOG (p. 4-22) AFTER CALIBRATION AND BEFORE LOG FILE IS SETUP.

5.1.3 MINISONDE FILE SETUP

1. Creating a File p. 4-8

2. Follow instructions in book

   a) Starting Date/Time and Stopping Date type what you desire. Leave Stopping Time at default time of 235959.

   b) Interval: 001500 (15 mins)
   Sensor Warmup: 000030 (30 secs)
   Circltr Warmup: 000030(30 secs)
   Enable Audio?: YES

3. Disconnect the black cable from the Minisonde and put back on protective black plug. Unscrew plastic calibration cup. Take to greenhouse and screw back on weighted guard and white connection cover then place in tank.

   [Make sure to label the minisonde with the file name created for that sonde]

5.1.4 MINISONDE: FROM GREENHOUSE TO RM 500.

1. Download and calibrate sondes in order from Control to last TRT.

2. When removed from tank, unscrew white plastic connection cover on top and weighted guard on bottom and leave at the tank.

3. Rinse the sonde well to clear muck, algae , snails, etc. off of housing and probes. [Rinse off TRT sondes in their respective tanks with 20ppt seawater]. Wipe dry.

4. Bring sonde into 500.

5. Replace DO membrane following procedure on p. 3-12. **NOTE**: minisonde only uses the STANDARD DO MEMBRANE.

6. After changing, screw on plastic calibration cup with a little **tap water.**

7. Change batteries following procedure on p. 5-17. Now some of the screws on some of these sondes are stripped - don't worry cause they still work fine. Wipe out the inside of the battery compartment cause sometimes water droplets fall in there after opening it up. Wipe off grunge around o-rings on battery cap too and replace with fresh goo.

6.0 QUALITY CONTROL/QUALITY ASSURANCE

Personnel should adhere to good laboratory practices performing this assay. This procedure should always be performed with proper precautions to minimize personnel exposure to dissolved oxygen probe solution and pH calibration solutions.

7.0 REFERENCES

DeWoskin, R.S. 1984. Good laboratory practice regulations: a comparison. Research Triangle Institute, Research Triangle Park, North Carolina. 63 pp.

USEPA. 1979. Good laboratory practice standards for health effects. Part 772 - Standards for development of test data. Fed. Reg. 44:27362-27375, May 9, 1979.

USEPA. 1980. Physical, chemical, persistence, and ecological effects testing; good laboratory practice standards (proposed rule). 40 CFR 772, Fed. Reg. 45:77353-77365. November 21, 1980.